

REMARKS

Claims 1 and 3-7 remain in the application with claims 1 and 3 having been amended hereby.

Reconsideration is respectfully requested of the rejection of claims 1, 3, and 4 under 35 USC 103, as being unpatentable over Sotome et al. in view of Fujinami.

As previously explained, the present invention is intended to provide a processing system for a headphone to improve the realism of audio signals played back over such headphone. An important object of the present invention is to cut down on the size of the digital signal processor needed to perform the signal processing.

The present invention teaches to eliminate the later stages of the digital filters so as to preclude the production of any reflective sound components. Thus, only the direct components are present in the first filter section, with the reflective portions then being added in the second filter section, which is also shortened but this time to eliminate the early stages of the filtering and to use only the reflective stages, a feature that is obtained by controlling the delay times in the impulse response filters.

The claims have been amended to emphasize that the present invention is intended for a headphone, which was previously set forth in the claims, and, furthermore, that the first filter means has only a predetermined limited number of delay stages so as to preclude effective reflective sound components from being produced. The claims already recited

that special delay times were provided in the second filter stage to produce the reflective sound components.

Sotome et al. relates to a so-called three-dimensional sound reproducing apparatus intended for use with two loudspeakers. Note that headphones are not suggested for use in Sotome et al.

Sotome et al. is concerned with eliminating so-called cross-talk effects, wherein sound from one speaker would be directed to the opposite ear of the listener. It is not clear why these cross talk components are to be eliminated. In any event, contrary to the examiner's assertion, there is nothing in Sotome et al. regarding excluding reflective sound components. In fact, as shown in Fig. 2 the transfer functions for the filters are built up using sounds being reflected from the walls of a space in which the binaural model is contained, along with the loudspeakers.

Therefore, it respectfully submitted that Sotome et al. clearly discloses that the reflective components are included in the filters. Moreover, Sotome et al. appears to provide two stages of filtering, in any event.

Fujinami is cited for a showing of a system in which reverberation effects can be produced. In Fujinami, a so-called convolver is provided that consists of infinite impulse response filters and delay units, all of whose outputs are summed and then fed through a finite impulse response filter.

It is respectfully submitted that there is no reason to add such a reverberation system to Sotome et al., since Sotome

et al. already provides extremely long filters that take into account the reflective sound components.

Accordingly, it is respectfully submitted that there is nothing in either of these two references that would suggest that a first filter section be so limited as to not provide any reflective sound components, as taught by the present invention and as recited in the amended claims.

Reconsideration is respectfully requested of the rejection of claims 5 and 6 under 35 USC 103, as being unpatentable over Sotome et al. in view of Fujinami and further in view of Inanaga et al.

Claims 5 and 6 depend from claim 1 which for the reasons set forth hereinabove are thought to be patentably distinct over the cited references and, for at least those very same reasons, claims 5 and 6 are also submitted to be patentably distinct thereover.

Although Inanaga et al. does show a head rotation detecting system for use in headphones, Inanaga et al. does not supply the teachings missing from the primary reference relating to the limited filter length in the first filter section.

Reconsideration is respectfully requested of the rejection of claim 7 under 35 USC 103, as being unpatentable over Sotome et al. in view of Fujinami and further in view of Inanaga et al. and Yamada et al.

Claim 7 depends from claim 1 which for the reasons set forth hereinabove is thought to be patentably distinct over

the cited references and, for at least those very same reasons, claim 7 is also submitted to be patentbly distinct thereover.

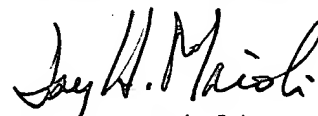
Yamada et al. is cited for showing a headphone system with a geomagnetic azimuth sensor. Nevertheless, Yamada et al. does not remedy the deficiencies of Sotome et al. concerning the limited filter length in the first filter section.

Accordingly, in view of the amendments made to the claims hereby, as well as the above remarks, it is respectfully submitted that an audio processing apparatus for a headphone having specially limited filter sections, as taught by the present invention and as recited in the amended claims, is neither shown nor suggested in cited references, alone or in combination.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

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